

The Claims

What is claimed is:

1. A process for stabilizing an aroma-providing component against loss or degradation of desirable flavor or sensory characteristics of its aroma during storage which comprises contacting the aroma-providing component with a stabilizing agent in a manner such that the stabilizing agent is provided in an amount effective to chemically interact with undesirable compounds associated with the aroma-providing component to form a stabilized aroma-providing component which: (a) retains a significant portion of one or more of the desirable flavor or sensory characteristics of the aroma in the aroma-providing component during storage, or (b) reduces off flavor generation during storage of the aroma-providing component, and wherein the stabilized aroma-providing component is essentially free of the stabilizing agent when a food or beverage product containing an aroma from the aroma-providing agent is prepared for consumption.

2. The process of claim 1, wherein the stabilizing agent is removed from the stabilized aroma-providing component prior to adding the stabilized aroma-providing component to a food or beverage product.

3. The process of claim 2 wherein the stabilizing agent is removed from the stabilized aroma-providing component by distillation, fractionation, precipitation, sublimation, ion-exchange, liquid-liquid extraction (organic or aqueous), aqueous liquid-oil extraction, oil-aqueous liquid extraction, chromatographic separation, or stripping.

4. The process of claim 3, which further comprises packing a column with the stabilizing agent and passing the aroma-providing agent through the column to stabilize the aroma-providing component.

5. The process of claim 3, which further comprises contacting the aroma-providing agent with the stabilizing agent to form a mixture, passing the mixture through a stripping column, optionally under vacuum, and collecting the stabilized aroma-providing component in a form where it is free of the stabilizing agent.

6. The process of claim 3, which further comprises contacting the aroma-providing agent with the stabilizing agent to form a mixture, passing the mixture through a liquid-liquid extraction column using coffee oil or another oil solvent as an extraction medium, and collecting the stabilized aroma-providing component in a form where it is free of the stabilizing agent.

7. The process of claim 1, wherein the stabilized aroma-providing component is prepared by incorporating the stabilizing agent into a material which is added to the aroma-providing component during storage but which material is separable or removable from the aroma-providing component, or the aroma-providing component is separable from the material, before preparation for consumption of a food or beverage product therefrom.

8. The process of claim 1, wherein the stabilized aroma-providing component is formed by contacting the aroma-providing component with a material that contains the stabilizing agent followed by separating the stabilized aroma-providing component from the material.

9. The process of claim 8, wherein the material that contains the stabilizing agent is associated with a container for packaging or storing the aroma-providing component prior to use of the component for preparing a food or beverage product.

10. The process of claim 1 wherein the aroma-providing component is treated with a stabilizing agent that interacts with compounds associated with the aroma-providing component to improve or preserve the aroma compounds that can improve the desirable flavor and sensory characteristics of the aroma component and to reduce the amount of compounds that are associated with the undesirable characteristics.

11. The process of claim 1, wherein the stabilized aroma-providing component is formed by incorporating the stabilizing agent into a material which is added to the aroma-providing component during storage and which further comprises separating the stabilized component from the material when a product for consumption is prepared.

12. The process of claim 1, wherein the stabilized aroma-providing component is formed by contacting a material that is processed to form the aroma-providing component with the stabilizing agent, followed by separating the stabilized aroma-providing component from the material.

13. The process of claim 12, wherein the aroma-providing component is obtained from coffee and the stabilizing agent is added to coffee beans prior to or during roasting, quenching, cooling, or extracting of the beans to generate or isolate an improved coffee aroma.

14. The process of claim 1, wherein the stabilizing agent is a compound that contains at least one atom having at least one lone pair of electrons and is present in an amount sufficient to react with some of the undesirable reactive compounds associated with the aroma-providing component to reduce some of the undesirable compounds, or to generate or preserve one or more aroma compounds that contribute to the desirable flavor or sensory characteristics of the aroma or that mask off flavors in the aroma-providing component.

15. The process of claim 14, wherein the undesirable reactive compounds contain carbonyl groups and the stabilizing agent complexes such compounds to form adducts that are separable from the aroma, resulting in a reduced level of carbonyls in the stabilized aroma-providing component, or the undesirable compounds generate or comprise free radicals and the stabilizing agent is present in an amount sufficient to reduce generation of or scavenge such free radicals so that the aroma component is stabilized and preserved.

16. The process of claim 14, wherein the stabilizing agent cleaves the aroma compounds containing disulfide bonds to generate or regenerate thiols that contribute to the desirable flavor and sensory characteristics of the aroma-providing component.

17. The process of claim 1, wherein the stabilizing agent is a compound that contains at least one atom of sulfur, nitrogen, oxygen or carbon with at least one lone pair of electrons and is used in an amount of between about 1 and 50,000 ppm.

18. The process of claim 1, wherein the stabilizing agent is a sulfite or a substance that contains or generates a sulfite, a thiol, an amine, an amino acid, or peptide and is used in an amount of between about 1 and 50,000 ppm.

19. The process of claim 18, wherein the stabilizing agent comprises a sulfite, cysteine or glutathione or their salts or materials containing such, or an enzyme present in an amount sufficient to react with carbonyls associated with the aroma-providing component.

20. The process of claim 18, wherein the stabilizing agent comprises a sulfite, cysteine or glutathione or their salts or materials containing such and they are present in an amount sufficient to exhibit sufficient reducing power to scavenge free radicals and to preserve sulfur aroma compounds in the aroma-providing component from oxidative degradation.

21. The process of claim 1, wherein the stabilizing agent is associated with another additive that acts as a carrier for the stabilizing agent, wherein the carrier is a solvent, an oil, an emulsion, a flavoring agent, a carbohydrate, a protein, or an antioxidant.

22. The process of claim 1, wherein the aroma-providing component is coffee aroma and the stabilizing agent is present in an amount sufficient to react with some or all of the carbonyl groups present in compounds associated with the coffee aroma to generate or regenerate thiols or to reduce or inhibit degradation of thiols in the coffee aroma, thus retaining the desirable flavor or sensory characteristics of the coffee aroma during at least two months of storage of the coffee aroma.

23. The process of claim 1, wherein the aroma is one of a chocolate or cocoa aroma, tea aroma, malt or Maillard reaction flavor.

24. The process of claim 1, wherein the stabilized aroma-providing component is a liquid that optionally includes an aroma carrier, or the stabilized aroma-providing component is dried to a powder and is stored until a later time when it is reconstituted for consumption by the addition of a liquid.

25. The process of claim 1, which further comprises combining the stabilized aroma-providing component with a food-forming or beverage-forming ingredient and a liquid to form a liquid food or beverage product, and drying the liquid product by spray-drying or freeze-drying to obtain a solid material that retains the initial flavor or sensory characteristic of the aroma for a time period of at least two months during storage of the solid material.

26. A packaged food or beverage product in the form of a package that contains therein a stabilized aroma-providing component having preserved or improved desirable flavor or sensory characteristics and being present in an amount sufficient to provide or impart its flavor or sensory characteristics to the product, wherein the aroma-providing component is stabilized with a stabilizing agent that is immobilized in, upon or within the package or upon or within a carrier placed upon or within or forming part of the container such that the stabilizing agent is separable or removable from the aroma-providing component, or the aroma-providing component is separable from the stabilizing agent before preparation for consumption of the food or beverage product, wherein the food or beverage product is essentially free of the stabilizing agent and further wherein the loss or degradation of the desirable flavor or sensory characteristics of the stabilized aroma-providing component are reduced or prevented such that the aroma-providing component retains its desirable flavor or sensory characteristics during an extended periods of storage at room temperatures.

27. The product of claim 26, wherein the stabilizing agent is immobilized onto ion-exchange resins and the resins are placed within, attached to or formed as part of the container for the aroma-providing component.

28. The product of claim 26, wherein the stabilizer is immobilized onto or within an insoluble matrix which is contacted with the aroma-providing component and subsequently separated from the stabilized aroma-providing component.

29. The product of claim 26, wherein the stabilizing agent is confined in a pouch made of a semi-permeable material that contains the stabilizing agent, and the pouch is placed within, attached to or forms part of the container.

30. The product of claim 29, the stabilizing agent is solution that is retained in the pouch and wherein the semi-permeable pouch is made of a material that allows carbonyls to permeate therethrough so that they are able to bind with the stabilizing agent and become at least partly confined within the pouch rather than in the aroma-providing component.

31. The product of claim 26, wherein aroma is coffee aroma and the aroma providing component has one of the following features: (a) a ratio of acetaldehyde to methanethiol that is 200 or less during storage over several months at room temperature; (b) an acetaldehyde concentration of 30 to 90 ppm after stabilization of a coffee aroma providing component that initially contains 150 ppm acetaldehyde or more; or (c) an acetaldehyde concentration of 20 to 60 ppm after stabilization of a coffee aroma providing component that initially contains 80 to 100 ppm acetaldehyde.

32. The product of claim 26, wherein a food or beverage product or a food-forming or beverage-forming ingredient is provided in the package along with the aroma-providing agent.

33. The product of claim 26, wherein the aroma-providing component is coffee aroma and the stabilizing agent is present in an amount sufficient to adduct carbonyls in the coffee aroma, remove or reduce carbonyls from the coffee aroma, or reduce the degradation of thiols in the coffee aroma.

34. The product of claim 26, wherein the aroma-providing component is a coffee aroma that has an initial concentration of acetaldehyde of about 40 to 2000 ppm but a concentration of acetaldehyde after stabilization of about 1 to 100 ppm wherein the acetaldehyde concentration is reduced by at least 50% during stabilization.

35. A stabilized aroma-providing component having enhanced and/or preserved desirable flavor or sensory characteristics and being sufficient to provide or impart flavor or sensory characteristics to its intended products, the component being stabilized with a stabilizing agent that is removed prior to the packaging or is immobilized in, upon or within the package or upon or within a carrier that is placed upon or within the container such that the stabilizing agent is separable or removable from the aroma-providing

component, or the aroma-providing component is separable from the stabilizing agent, before preparation for consumption of its flavored food or beverage products, wherein the product is essentially free of the stabilizing agent and further wherein the loss or degradation of the desirable flavor or sensory characteristics of the stabilized aroma-providing component are reduced or prevented such that it retains its desirable flavor or sensory characteristics during storage of the product for an extended period of time at ambient or room temperatures.

36. A stabilized coffee aroma-providing component that has one of the following features: (a) a ratio of acetaldehyde to methanethiol that is 200 or less during storage over several months at room temperature; (b) an acetaldehyde concentration of 30 to 90ppm after stabilization of a coffee aroma providing component that initially contains 150ppm acetaldehyde or more; or (c) an acetaldehyde concentration of 20 to 60ppm after stabilization of a coffee aroma providing component that initially contains 80 to 100ppm acetaldehyde.

37. The stabilized coffee aroma-providing component of claim 36 having an initial concentration of acetaldehyde of between about 40 to 2000 ppm but a concentration of acetaldehyde after stabilization of about 1 to 100 ppm wherein the acetaldehyde concentration is reduced by at least 50% during stabilization.

38. A packaged food or beverage product in the form of a package that contains therein the stabilized coffee aroma-providing component of claim 36 in an amount sufficient to provide or impart its flavor or sensory characteristics to the product.